

**EQUIPMENT-COMPRESSED NATURAL GAS
(INCLUDING ALL EQUIPMENT)**

**MILWAUKEE COUNTY
COMPRESSED NATURAL GAS
FUELING STATION
W-DOT PROJECT 1693-28-74**

TECHNICAL DATA SHEETS

1. COMPRESSOR PACKAGE

A skid-mounted lubed compressor package rated for a total of 200 scfm at 4500 psig discharge and continuous operation is to be provided. The package shall have a guaranteed maximum oil carry over of no more than 0.5 lb oil per MMCF natural gas. Complete the following data sheet and include it with the Bid.

TECHNICAL DATA - COMPRESSOR PACKAGE

The Vendor supplies the following information and warrants that the performance and characteristics of the equipment to be furnished will be as hereinafter stated, and the design adheres to all applicable codes as specified.

Compressor (Each)

1. Compressor type: _____

Capacity: _____ scfm @ _____ psig suction
**Required* 220 scfm @ 50 psig suction

Model number: _____

Compressor block manufacturer: _____

2. Compressor discharge of: _____ psig
**Required:* 4500 psig

3. Brake horsepower required: _____ hp

4. Final gas outlet temperature at 100°F ambient (compressor outlet temp. gauge):
_____ ° F **(Max. Allowed - 120 deg. F)*

5. Oil Carryover: _____ lb./MMCF **(Max. Allowed - .5 lb/MMCF)*

6. Type of oil lubricating system: _____

7. Suction Particulate Filter: Manufacturer: _____ Model/Size: _____
Element Size: _____ (microns) **(Required: 3PU absolute rated element)*

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8. Interstage and Final Coalescing Filters: Make: _____ Model/Size: _____
Number of Filters per Compressor: _____ Element Size: _____ (microns)
**(Minimum Required: One grade 10 pre-coalescer and one grade 4 final coalescer)*

1. Are any valves compressed air operated? Y/N
2. Is compressor interstage tubing of face seal, zero tolerance design? Y/N
3. Has compression equipment been evaluated and listed by a Nationally
Recognized Testing Laboratory (NRTL)? Y/N If so, which one?

Electrical

Motors to be of high efficiency design and constructed to meet National Electrical Code.
The electric drive motor shall be provided with thermostatic protection and sized to a minimum
of 10% over compressor rated horsepower. Motors shall be suitable for Class I, Division I,
Group D applications. Service factor rating of 1.15 shall apply and shall not be utilized for 10%
minimum rating.

8. 480 Volt, 3 phase, 60 Hz motor, indicate following:
- a. manufacturer: _____
 - b. type: _____
 - c. horsepower: _____ hp
 - d. startup amperage: _____ A
 - e. running amperage: _____ A
 - f. service factor: _____
 - g. operating load efficiency: _____ %
10. Motor starters:
- a. Manufacturer: _____
 - b. Type: _____
11. Requirements for controls and heaters: _____ V _____ A

Note: All transformers, protection, etc. required for controls to be provided by Vendor.
All power to compressor skid shall be provided from a single 460 Volt, 3 phase power
supply. Separate control power transformer shall be provided by vendor. Vendor shall
provide a single disconnect and breaker to kill all power to the skid and other equipment.
Disconnect shall include shunt trip tied in with liquid dispenser trip.

2. DRYER

A packaged single tower, manually initiated self regenerative dryer system for installation at the inlet of the compressor shall be provided, the dryer shall be mounted within the compressor enclosure or a separate enclosure. Complete the following data sheet and include it with the Bid.

TECHNICAL DATA - GAS DRYING SYSTEM

The Vendor provides the following information and warrants that the identity, characteristics, and performance of the equipment to be supplied will be as stated below and that their design and manufacturer meets all applicable codes in Wisconsin, U.S.A.

1. Type, make, and model of dryer _____

Drying material: _____

Regeneration procedure: _____

**Self-regeneration is required.*

Rated Dryer Flowrate: _____
**200 scfm is required.*

Assuming inlet gas water content is 7 lbs. per MMCF:

Water content of dry gas (lb/MMCF) _____

Dew point of dry gas at 3600 psig (° F) _____
** Max. Dew point Allowed is -40 deg. @ 3600 psig*

Amount of gas dried between regenerations (MMSCF) _____
** Amount of gas required is 3.0 MMSCF, minimum*

2. Voltage and amperage requirements of dryer: _____

Average power consumption during normal operation (kWh/24 hour) _____

3. Is an air purge required? Yes/No

3. GAS STORAGE

A 3-bank cascade storage system, consisting of ASME vessels with a 4500 psig operating pressure, a 5000 psig design pressure, associated electronic prioritizing system and ASME relief valves are to be provided. The priority system shall be able to provide three (3) banks filling with vehicle direct flow of compressor output during fueling process.

Complete the following data sheet and include it with the Bid.

TECHNICAL DATA - GAS STORAGE SYSTEM

The Vendor provides the following information and warrants that the identity, characteristics, and performance of the equipment to be supplied will be as stated below and that their design and manufacturer meets all applicable codes in Wisconsin, U.S.A.

1. Type and make of storage vessels: _____

Design pressure (psig): _____

**Required design pressure of 5000 psig.*

Operating pressure (psig): _____

**Required operating pressure of 4500 psig.*

Storage Capacity _____

**Recommended minimum capacity of 30,000 SCF. (Alternate storage capacity may be considered)*

Water capacity of each vessel (ft³) _____

Usable Gasoline Gallon Equivalents of entire cascade (GGE) _____

Number of vessels: _____

Dimensions of each vessel: _____

Manufacturing date of vessels: _____

Relief valve model and setting: _____

Number of relief valves: _____

Flow capacity of each relief valve at 110% overpressure (scfm): _____

Are locking isolating ball valves provided for each relief valve? Y/N.

Brass padlocks included? Y/N

4. DISPENSING EQUIPMENT

A two hose fueling dispenser NGV1, Type 1 approved dispensing nozzles is to be provided with electronic temperature compensation to regulate to 3000 psig on one hose and 3600 psig on the other @ 70 deg. F (ambient) with compensation for heat of compression. All piping, tubing and hoses are to be designed to 5000 psig and the dispenser is to be equipped with an excess flow shut off system.

Algorithm based software to provide vehicle filling control that calculates the vehicles required fuel capacity compensating for ambient temperature, heat of compression and vehicle cylinder temperature rise so as to provide accurate fills to within 95% of vehicle rated capacity over the specified equipment ambient temperature operating range.

Dispensing equipment shall be designed for outdoor use and equipped with means to protect all operating controls and electrical wiring from climatic conditions. Exposure to normal weather conditions shall not interfere with the performance and safety of the equipment supplied under this specification.

Dispenser fueling hose shall be conductive type designed for CNG service and appropriately marked for said service. Each hose shall incorporate a breakaway connection to prevent loss of CNG and minimize damage to the dispenser in the event fueling hose is pulled away from dispenser.

Coalescing type, in line filters of not greater than 25 micron shall be provided for each line of fuel supply. Filters shall be accessible for maintenance and drainage and incorporated into the dispenser cabinet

The electronic digital display shall show quantity (based on GGE), dollars dispensed and dollar/unit. The unit must include battery backed totalizers. Dispenser shall utilize a new fuel island terminal card reader (to be furnished and installed by Vendor) that is compatible with and interfaced into the existing Gilbarco dispensers and Gilbarco G-Site fuel management and card reader systems (Interface and compatibility must be guaranteed). Price changes shall be easily made with built-in keypad or other means without removing fixed panels of dispenser. Complete the following data sheet and include it with the Bid.

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TECHNICAL DATA -GAS DISPENSING SYSTEM

The Vendor provides the following information and warrants that the identity, characteristics, and performance of the equipment to be supplied will be as stated below and that their design and manufacturer meets all applicable codes in Wisconsin, U.S.A.

1. Piping requirements to/from dispenser:

Number of pipes to dispenser: _____

Size, wall thickness and type of pipe(s): _____

Design pressure (psig): _____
**Required 5000 psig*

Number of pipes from dispenser: _____

Size, wall thickness and type of pipe(s): _____

Design pressure (psig): _____
**Required 5000 psig*

2. Type, make, and model of gas control valve(s): _____

Design pressure (psig): _____
**Required 5000 psig*

Location: _____

3. Type, make, and model of gas flow meter: _____

Design pressure (psig): _____
**Required 5000 psig*

4. Type, make, model of dispenser nozzle: _____

5. Gas discharge on hose 1: _____ psig **Required 3000 psig*

Gas discharge on hose 2: _____ psig **Required 3600 psig*

Hose design pressure (psig) _____
**Required 5000 psig*

6. Guaranteed fill time and fill pressure (immediately after fill completion) for vehicle with a 7 gasoline gallon equivalent CNG tank at 300 psi initial pressure, assume 3600 psi fill, NGV-1 receptacle/check valve and 6 feet of 1/4 inch tubing to vehicle tank(s):

@ 20⁰F ambient temp _____ minutes, _____ fill pressure, psi

@ 100⁰F ambient temp _____ minutes, _____ fill pressure, psi

Will dispenser fill algorithm allow vehicle fills to 120% of vehicle tank rated capacity when ambient temperature is high enough to require it for a full (heat of compression compensated) fill? Y/N.

What is the maximum pressure as a percentage of rated capacity to which the dispenser will fill using the dispenser fill algorithm- _____ %

7. Has dispenser been evaluated and listed by a Nationally Recognized Testing Laboratory (NRTL)? Y/N If so, which one. _____

5.0 ENCLOSURE

5.1 The manufacturer shall provide a fabricated steel sound attenuating weather-barrier enclosure for the compression equipment. Said enclosure shall be constructed so as to be considered an outdoor installation per NFPA 52. One side shall be open steel mesh and a roof vent shall be provided to prevent gas accumulation within the enclosure.